STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086

M.Sc., BIOINFORMATICS

END SEMESTER EXAMINATION APRIL 2019

PAPER: Systems Biology

TIME

: 3hours

SUBJECT CODE: 15BI/PI/SB34

Max. Marks: 100

SECTION - A

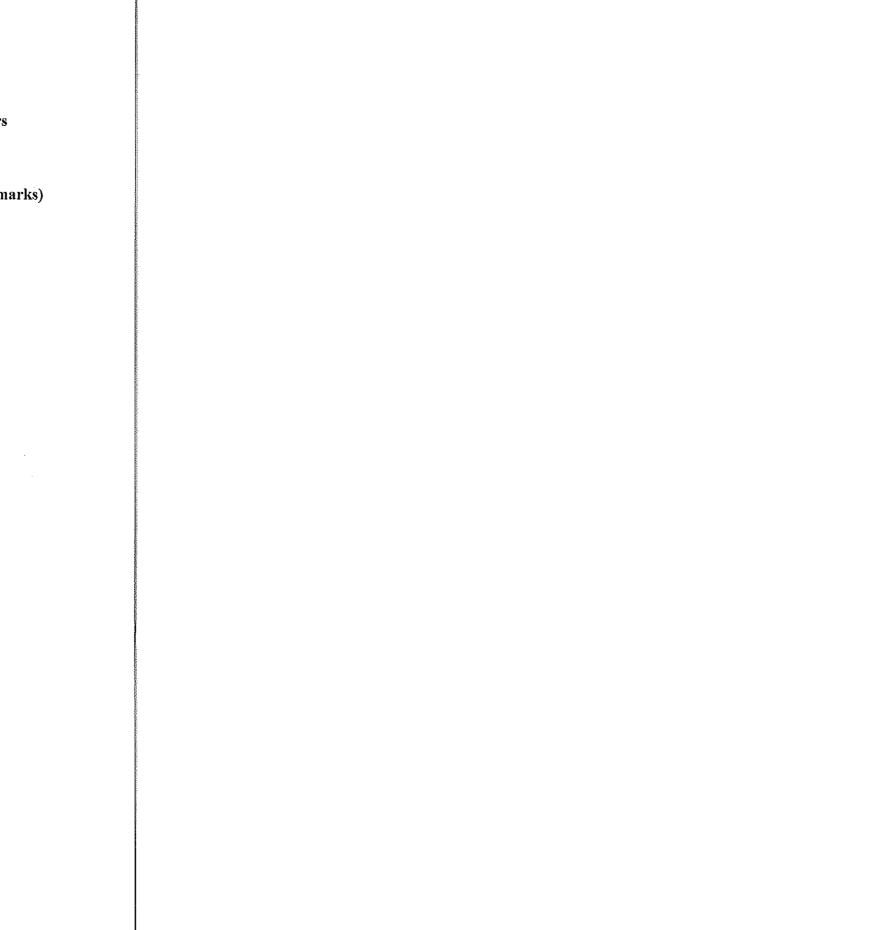
 $(20 \times 1 = 20 \text{ marks})$

Answer all the Questions:

1. Define systems biology.

- 2. Write about modularity in systems biology
- 3. Comment on SOM.
- 4. What do you understand by metabolic networks?
- 5. What is Principal Component Analysis?
- 6. What are the major classes of biomolecules?
- 7. Explain Gene Expression.
- 8. What is gene network?
- 9. Define Receptor-Ligand interactions.
- 10. What is a microarray?
- 11. Define linear model data
- 12. Define fold-change analysis
- 13. What do you understand by metabolic networks?
- 14. Define clustering.
- 15. Comment on directed graph.
- 16. Write on hierarchical clustering?
- 17. Comment on text mining
- 18. Mention the applications of systems biology.

19. Give the significance of steady state in systems biology. 20. List few advantages of computational modeling.



SECTION-B

 $(4 \times 10=40 \text{ marks})$

ANSWER ANY FOUR QUESTION

- 21. Write the concept of systems biology in medicinal drug development
- 22. Discuss the various properties of models in systems biology.
- 23. Describe how mathematics is applied in the field of systems biology.
- 24. Give an account on how Systems biology is data integration process.
- 25. Explain the guidelines for the design of new organisms and its computational limitations?
- 26. Enumerate the experimental planning in systems biology.
- 27. Describe the various standard models and approaches in systems biology.

SECTION-C

(2 x 20=40 marks)

ANSWER ANY TWO QUESTION

- 28. Write in brief the clustering algorithms in the analysis of gene expression data.
- 29. Justify the significance of the following statement "systems biology is living science".
- 30. Discuss in detail the representation of gene network as directed and undirected graph.
- 31. Explain in detail the potential dangers of the emerging system biology technique?

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